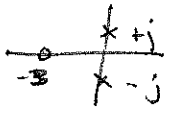
11

1. 

2. $y(t) = 2\sin(t) \cdot \underline{1}(t)$

12

1. Apply 1st order Taylor series
2. $\zeta = 1/\sqrt{2}$, $\omega_n = \sqrt{2}$
3. B

13

1. a) $\frac{1}{s^2+4s+4k}\begin{bmatrix} s+4 & -4k \\ 1 & s \end{bmatrix}$

   b) Use $G(s) = C(sI-A)^{-1}B + D$.

2. $k \geq 2$
3. (c) + (d)
4. $\frac{X_2(s)}{F(s)} = \frac{1}{s^4+s^3+3s^2+2s+1}$

   $\frac{V_{out}(s)}{V_{in}(s)} = \frac{1}{(s+1)^2}$